

WHAT IS CLAIMED IS:

1. A superabsorbent material, comprising:  
a superabsorbent material treated with a non-particulate solution to resist damage when subjected to an Absorbent Product Processing Simulation Test;  
wherein the treated superabsorbent material has a centrifuge retention capacity of about 15 grams or greater of 0.9 weight percent sodium chloride aqueous solution per gram of the treated superabsorbent material and a gel bed permeability (GBP) at a 0 psi swell pressure on pre-screened 300-600 micron particles of about  $200 \times 10^{-9} \text{ cm}^2$ ) or greater prior to subjecting the treated superabsorbent material to the Absorbent Product Processing Simulation Test; and subsequent to subjecting the treated superabsorbent material to the Absorbent Product Processing Simulation Test the treated superabsorbent material exhibits at least one property selected from the group consisting of: (1) a reduction in GBP value at a 0 psi swell pressure on pre-screened particles of about 20% or less; (2) a reduction in GBP value at a 0.3 psi swell pressure on pre-screened particles of about 50% or less; (3) a reduction in GBP value at a 0 psi swell pressure on un-screened particles of about 50% or less; (4) a reduction in GBP value at a 0.3 psi swell pressure on un-screened particles of about 60% or less; and (5) an average particle size reduction of about 20% or less.
2. The superabsorbent material of Claim 1, wherein the superabsorbent material is treated with about 10% to about 1000% aqueous solution of a hydrophilic soft polymer by weight of the superabsorbent material, wherein the hydrophilic soft polymer has a glass transition temperature of about 20 degrees Celsius or less.
3. The superabsorbent material of Claim 1, wherein the treated superabsorbent material has a GBP value at a 0 psi swell pressure on pre-screened 300-600 micron particles of about  $800 \times 10^{-9} \text{ cm}^2$ ) or greater prior to subjecting the treated superabsorbent material to the Absorbent Product Processing Simulation Test.

4. The superabsorbent material of Claim 1, wherein the treated superabsorbent material has a centrifuge retention capacity of about 20 grams or greater of 0.9 weight percent sodium chloride aqueous solution per gram of the treated superabsorbent material prior to subjecting the treated superabsorbent material to the Absorbent Product Processing Simulation Test.

5. The superabsorbent material of Claim 1, wherein the treated superabsorbent material has a centrifuge retention capacity of about 25 grams or greater of 0.9 weight percent sodium chloride aqueous solution per gram of the treated superabsorbent material prior to subjecting the treated superabsorbent material to the Absorbent Product Processing Simulation Test.

6. The superabsorbent material of Claim 1, wherein, subsequent to subjecting the treated superabsorbent material to the Absorbent Product Processing Simulation Test, the treated superabsorbent material exhibits at least two properties selected from the group consisting of: (1) a reduction in GBP value at a 0 psi swell pressure on pre-screened particles of about 20% or less; (2) a reduction in GBP value at a 0.3 psi swell pressure on pre-screened particles of about 50% or less; (3) a reduction in GBP value at a 0 psi swell pressure on un-screened particles of about 50% or less; (4) a reduction in GBP value at a 0.3 psi swell pressure on un-screened particles of about 60% or less; and (5) an average particle size reduction of about 20% or less.

7. The superabsorbent material of Claim 1, wherein, subsequent to subjecting the treated superabsorbent material to the Absorbent Product Processing Simulation Test, the treated superabsorbent material exhibits at least three properties selected from the group consisting of: (1) a reduction in GBP value at a 0 psi swell pressure on pre-screened particles of about 20% or less; (2) a reduction in GBP value at a 0.3 psi swell pressure on pre-screened particles of about 50% or less; (3) a reduction in GBP value at a 0 psi swell pressure on un-screened particles of about 50% or less; (4) a reduction in GBP value at a 0.3 psi swell pressure on un-screened particles of about 60% or less; and (5) an average particle size reduction of about 20% or less.

8. The superabsorbent material of Claim 1, wherein, subsequent to subjecting the treated superabsorbent material to the Absorbent Product Processing Simulation Test, the treated superabsorbent material exhibits at least four properties selected from the group consisting of: (1) a reduction in GBP value at a 0 psi swell pressure on pre-screened particles of about 20% or less; (2) a reduction in GBP value at a 0.3 psi swell pressure on pre-screened particles of about 50% or less; (3) a reduction in GBP value at a 0 psi swell pressure on un-screened particles of about 50% or less; (4) a reduction in GBP value at a 0.3 psi swell pressure on un-screened particles of about 60% or less; and (5) an average particle size reduction of about 20% or less.

9. The superabsorbent material of Claim 1, wherein the treated superabsorbent material has a GBP value at a 0.3 psi swell pressure on pre-screened 300-600 micron particles of about  $100 \times 10^{-9} \text{ cm}^2$  or greater, and a centrifuge retention capacity of about 25 grams or greater of 0.9 weight percent sodium chloride aqueous solution per gram of the treated superabsorbent material, prior to subjecting the treated superabsorbent material to the Absorbent Product Processing Simulation Test.

10. The superabsorbent material of Claim 1, wherein the treated superabsorbent material has a GBP value at a 0.3 psi swell pressure on pre-screened 300-600 micron particles of about  $200 \times 10^{-9} \text{ cm}^2$  or greater, and a centrifuge retention capacity of about 25 grams or greater of 0.9 weight percent sodium chloride aqueous solution per gram of the treated superabsorbent material, prior to subjecting the treated superabsorbent material to the Absorbent Product Processing Simulation Test.

11. The superabsorbent material of Claim 1, wherein, subsequent to subjecting the treated superabsorbent material to the Absorbent Product Processing Simulation Test, the treated superabsorbent material exhibits a reduction in GBP value at 0 psi swell pressure on pre-screened 300-600 micron particles of about 10% or less.

12. The superabsorbent material of Claim 1, wherein, subsequent to subjecting the treated superabsorbent material to the Absorbent Product Processing Simulation Test, the treated superabsorbent material exhibits a reduction in GBP value at 0.3 psi swell pressure on pre-screened 300-600 micron particles of about 30% or less.

13. The superabsorbent material of Claim 1, wherein, subsequent to subjecting the treated superabsorbent material to the Absorbent Product Processing Simulation Test, the treated superabsorbent material exhibits a reduction in GBP value at 0.3 psi swell pressure on un-screened particles of about 40% or less.

14. The superabsorbent material of Claim 1, wherein the superabsorbent material comprises a crosslinked polyelectrolyte including at least one of the group consisting of anionic polymers, cationic polymers, and combinations thereof.

15. The superabsorbent material of Claim 14, wherein the anionic polymers comprise functional groups selected from the group consisting of carboxyl, sulfonate, sulphate, sulfite, phosphate, and combinations thereof.

16. The superabsorbent material of Claim 14, wherein the anionic polymers are selected from the group consisting of salts of polyacrylic acid, polyacrylamido methylpropane sulfonic acid, polyvinyl acetic acid, polyvinyl phosphonic acid, polyvinyl sulfonic acid, isobutylene-maleic anhydride copolymer, carboxymethyl cellulose, alginic acid, carrageenan, polyaspartic acid, polyglutamic acid, and copolymers or mixtures thereof.

17. The superabsorbent material of Claim 14, wherein the cationic polymers comprise functional groups selected from the group consisting of primary, secondary, and tertiary amine, imine, amide, quaternary ammonium, and combinations thereof.

18. The superabsorbent material of Claim 14, wherein the cationic polymers are selected from the group consisting of salts of polyvinyl amine, polydiallyl dimethyl ammonium hydroxide, polyacrylamidopropyl trimethyl ammonium hydroxide, polyamino propanol vinyl ether, polyallylamine, chitosan, polylysine, polyglutamine, and copolymers or mixtures thereof.

19. An absorbent material comprising the superabsorbent material of Claim 1.

20. An absorbent article comprising the superabsorbent material of Claim 1.

21. The absorbent article of Claim 20, comprising an absorbent layer having at least one region containing superabsorbent material in a concentration of about 10% superabsorbent material or greater based on total weight of the absorbent layer.

22. A method of increasing damage resistance of a superabsorbent material, comprising the steps of:

adding an aqueous solution of a hydrophilic soft polymer to a superabsorbent material, wherein the hydrophilic soft polymer has a glass transition temperature of about 20 degrees Celsius or less;

mixing the aqueous solution and the superabsorbent material; and  
at least partially drying the superabsorbent material.

23. The method of Claim 22, comprising adding between about 10% and about 1000% aqueous solution by weight of the superabsorbent material.

24. The method of Claim 22, wherein the aqueous solution of the hydrophilic soft polymer comprises the hydrophilic soft polymer at between about 0.1% and about 10% by weight of the solution.

25. The method of Claim 22, comprising drying the superabsorbent material at a temperature between about 20 and about 150 degrees Celsius.

26. The method of Claim 22, further comprising the steps of filtering the superabsorbent material and separating at least some agglomerated particles.

27. The method of Claim 22, further comprising incorporating the superabsorbent material into an absorbent article subsequent to drying the superabsorbent material.

28. A superabsorbent material, comprising:  
a superabsorbent material treated with an absorbent particulate material to resist damage when subjected to an Absorbent Product Processing Simulation Test;  
wherein the treated superabsorbent material has a centrifuge retention capacity of about 15 grams or greater of 0.9 weight percent sodium chloride aqueous solution per gram of the treated superabsorbent material and a gel bed permeability (GBP) at a 0 psi swell pressure on pre-screened 300-600 micron particles of about  $200 \times 10^{-9} \text{ cm}^2$ ) or greater prior to subjecting the treated superabsorbent material to the Absorbent Product Processing Simulation Test; and subsequent to subjecting the treated superabsorbent material to the Absorbent Product Processing Simulation Test the treated superabsorbent material exhibits at least one property selected from the group consisting of: (1) a reduction in GBP value at a 0 psi swell pressure on pre-screened particles of about 20% or less; (2) a reduction in GBP value at a 0.3 psi swell pressure on pre-screened particles of about 50% or less; (3) a reduction in GBP value at a 0 psi swell pressure on un-screened particles of about 50% or less; (4) a reduction in GBP value at a 0.3 psi swell pressure on un-screened particles of about 60% or less; and (5) an average particle size reduction of about 20% or less.